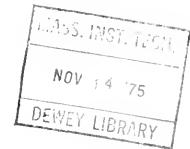


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Direct Investment, and European Direct
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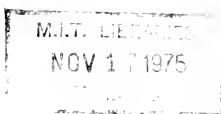
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OLIGOPOLISTIC IMITATION, THEORIES OF FOREIGN DIRECT INVESTMENT,
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Introduction: Theories of Foreign Direct Investment

Despite the fact that foreign direct investment and the related phenomenon of the multinational enterprise have been studied extensively for about a decade and a half, there does not exist at the time of the writing of this article a unified, generally accepted theory explaining why foreign direct investment takes place. Indeed, such a theory might never exist. The more the problem is studied, the more it becomes clear that there exists a multiplicity of causal factors stimulating such investment. These underlying causes may in fact be so diverse as to nullify the possibility that a single, neat theoretical construct can be created. The prime purpose of this paper is to examine one hypothetical cause, which I have dubbed "exchange of threat," in some depth. Because the "exchange of threat" concept does not appear prominently in the literature on foreign direct investment, it is of some utility to examine where and how the concept would fit into the existing body of theory to explain such investment.

Despite the lack of a unified theory most hypotheses aimed at some partial explanation of foreign direct investment do have elements in common. Virtually all such hypotheses ascribe as prime causalities for foreign direct investment "imperfections" in world markets for goods, services, and factors of production.¹ Almost everyone can agree with one noted international economist's observation that in a world characterized by "perfect" competition, foreign direct investment would not occur.²

A groundbreaking 1960 study suggested that a prime causal factor behind foreign direct investment by business firms is oligopoly advantage.³ The study demonstrated that most firms engaged in multinational activities are oligopolists, and therefore suggested that direct foreign investment was better studied from the point of view of industrial organization rather than the traditional "neoclassical" approach to the theory of capital movements.

There is a conceptual difference between the two approaches in the assumptions each makes about firm behavior. Under "neoclassical" thinking, the firm, which is either a monopolist protected by insurmountable barriers to entry or an atomistic price taker in its market, responds to variables which are impersonally determined by the forces of the market, and in making its response, the firm does not alter the values of these variables. Under "industrial organization" thinking, the firm, which is typically an oligopolist, responds to the actions, past or prospective, of other firms as well as to the impersonal forces of the market place. Conversely, the actions of any one firm will affect the subsequent actions of its competitors - thus, in making a strategic move, a firm not only responds to the previous actions of its competitors, but also must consider the probable response of its competitors to the move.⁴

Under an industrial organization approach to the explanation of foreign direct investment, three elements are prerequisite within an industry before such investment takes place. First, there must exist some sort of oligopoly advantage possessed by a small number of firms which creates a major barrier to entry to the industry.⁵ Second, there must exist foreign markets in which this advantage can be exploited. (These markets are "foreign" in the sense that they are located within nations other than in which the oligopolists are domiciled.) And third, there must exist some process by which the

advantage, and hence the barriers to entry to the industry, will erode over time. This erosion results in interactive firm behavior which in turn leads to foreign direct investment.⁶

In order to exploit the foreign market, the oligopolist would be likely to choose, initially at least, to export the product rather than to manufacture it inside the foreign market. This would be true because the marginal cost of manufacturing the product at home and shipping it to the foreign market would in general be less than the average cost of overseas manufacture. High barriers to entry would prevent local firms in the foreign market from entering into the industry, and thus the exporting firms would be able to extract an oligopoly rent from exportation as well as from home market production. If the overseas elasticity of demand were high and either the cost of shipping the product were high relative to total value added or high tariffs were imposed by the importing nation, the exporting firms might choose to establish manufacturing capacity abroad rather than to export. This generally, however, would not be the case at the outset.

If, for some reason, the barriers to entry to the industry erode over time, new entrants may be attracted to the industry by the oligopoly rent. In his home market, the oligopolist may be able to thwart new entry by pricing the product at some "stay-out" price below that which would maximize his short-run profitability.⁷ The ability of the oligopolist to maintain the "stay-out" price may be buttressed either by an absolute cost advantage accruing to him by virtue of his being lower on the learning curve than potential new entrants or by scale economies advantages. In the foreign market, however, the oligopolist may be unable to maintain a "stay-out" price if local new entrants are able to convince their local government to impose a protective tariff on the oligopolist's product (or otherwise to restrict importation of the product).

It is either in response to such a move by a foreign government or to forestall such a move that the oligopolist makes a foreign direct investment. In doing so, the investing firm is in effect reacting to the threat of competition from new, local entrants in the foreign market, who are in turn increasingly able to surmount the barriers to entry to the industry. The investing firm, which is now a "foreign" firm operating directly in the host nation market, faces certain disadvantages with respect to local competitors (see footnote 2.). If the "foreign" firm does not have some offset against these advantages, such as an absolute cost advantage, the ability to deploy world-wide economies of scale, or perhaps the possession of a preferred trade name, the firm may be forced to withdraw from the host nation market altogether. The ability of the firm to be "multinational," i.e., to operate directly in markets over which a sovereign state governs (other than the sovereign state which governs the firm's "home" market), is entirely dependent on its ability to retain some sort of oligopoly advantage after initial barriers to entry have broken down.

Illustrative of an industrial organization approach to explaining foreign direct investment is the product life cycle hypothesis. The product cycle has been advanced primarily as an explanation of certain types direct investment by U.S. based firms in Western Europe in the manufacturing sector during the decades following World War II, although it has also been used to explain certain types of U.S. direct foreign investment in other locations and at other times.⁸

The product cycle hypothesis posits that there came to exist in the United States, beginning sometime around the turn of the century, a unique set of conditions which motivated U.S.-based firms to innovate and commence production of manufactured products which were appealing to high income consumers or were labor saving.⁹ These conditions included the large size of the domestic U.S.

market, the high per-capita income of the U.S. consumer, and a relative scarcity of artisan labor, which, coupled, with the high wage cost of less skilled labor, forced U.S. industrialists to develop process technology to enable them to substitute capital intensive processes for labor intensive ones. The result was that U.S. firms were motivated to produce advanced consumer goods (creating a derived demand for technologically advanced capital goods and intermediate products) than were their European counterparts.¹⁰

According to the product cycle concept, in many foreign markets, especially those in Western Europe in the post-World War II period, as per capita income grew there arose a demand for U.S.-type goods. To supply this demand, U.S. firms were able to export to these markets. At the outset, U.S. firms would possess an advantage over foreign competitors based on technology.

A product, however, undergoes a "life cycle." Initially, when the product is new, the technology of the product is likely to be closely held, and it is likely to be constantly changing as the product is improved. At this early stage of the product life cycle a tremendous advantage is held by the innovators of the product; he understands the product and how to produce it. This advantage poses a formidable barrier to entry and enables the innovators to capture an oligopoly rent on the product. Over time, however, the product is perfected and the technology of the product becomes more widely understood. In order to capitalize on scale economies in manufacturing the product, the manufacturer must standardize the product, and hence he enables competitors to copy it more easily. The diffusion of technological knowledge results in an erosion of the barriers to entry. New entrants, possibly drawn into the market by the oligopoly rent, are able to copy the product and to introduce into the market their own imitations. Often, the imitators eventually bring to the market a version of the product that is better or cheaper than the original innovator's version.

Thus, often the initial barriers to entry collapse. Eventually, as the technology of the product becomes widely diffused, and the product itself becomes highly standardized, widespread competition may drive the price to competitive levels.

Under the product cycle hypothesis, it was when European firms became able to imitate the U.S. firms by producing locally those products which the U.S. firms have been exporting to Europe that U.S. direct foreign investment takes place. In order to defend an established market in a Western European country from the threat of a local competitor, the U.S. firm would establish manufacturing facilities within that market. By becoming itself a local manufacturer, the U.S. firm both bypasses potential problems of exportation (such as tariffs or quotas) and simultaneously avails itself of some of the advantages the local producer might have (such as lower wage costs).

Empirical tests of the product cycle indicate that the power of the theory is significant to explain certain types of U.S. direct investment in Western Europe during the period 1950-1970.¹¹ The life cycle cannot, however, explain all U.S. direct investment in Europe during that period. In at least two industries - bulk industrial chemicals and primary aluminum reduction - U.S. firms have not generally possessed any significant technological advantage relative to European rivals, yet U.S. firms in these industries have made sizeable direct investments in European nations. A possible explanation of this investment is that in the years following World War II European firms were unable to expand capacity rapidly enough to meet the growing demand for these products in revitalized European markets and that U.S. firms were able to capture market share more or less by default. During these post-War years, as has been repeatedly noted, European industry was chronically short of capital, and easier access to U.S. capital markets may have contributed to the ability

of U.S. firms to bridge the gap between European demand and supply in the aluminum and chemical industries.

Technology may then not have constituted the only initial advantage possessed by U.S. firms which invested heavily in Europe in the post-War era. One study of the food processing industry suggests that skills in marketing (advertising and distribution) and perhaps ability to administer a geographically dispersed organization constituted the initial advantage of U.S. food processors who established during this era major operations in Western Europe.¹² In other industries similar skills and abilities may also have contributed to U.S. firms' initial advantage.

The industrial organization approach to the explanation of foreign direct investment forms one "school of thought" on the subject. Capital market imperfections form the basis for another "school of thought."

Exchange rate risk arising from capital market imperfections forms the basis for one hypothesis.¹³ The reasoning is that holders of liquid assets are willing to pay some sort of premium to be able to hold these assets in one currency rather than some other. Logically, the premium would be attached to the stronger currency. (The currency is "stronger" in the sense that the a priori expectation is that this currency will, over time, appreciate in value relative to the other currency.) If the premium is accurately reflected in the interest rate differential between the two currencies, such that the differential is equal to the sum of the premium plus the effective rate at which the stronger currency is likely to appreciate relative to the weaker currency, then an investor domiciled in a relatively strong currency area will be able to borrow capital at a lower rate of interest (or issue equity at a higher capitalization rate) than an investor domiciled in a weaker currency area.¹⁴ Hence, it is argued that the rate at which the strong currency investor is willing to discount an income stream is lower than the rate at which the weak currency investor would be willing to discount

the same income stream. Thus, the value of this income stream, in net present value terms, is greater for the strong currency investor than for the weak currency investor. Investment opportunities in the weak currency areas which are unattractive to local investors (because of these investors' high discount rate) might be attractive to foreign investors from strong currency areas, who can capitalize the investment at a lower discount rate.¹⁵ Thus, investment capital might flow from strong currency areas to weaker ones.

One problem with this line of reasoning is that in the middle to late 1960's, when the rate of U.S. direct foreign investment in Europe was at record levels and greatly exceeded the rate of European direct foreign investment into the United States, the dollar was "overvalued" with respect to major European currencies. Thus, the net flow of direct foreign investment was from the "weak" currency area to the "strong" currency area, the opposite of what the exchange rate risk theory would predict. It is argued, however, that investors from weak currency areas would have an incentive to invest in strong currency areas if interest-rate differentials fail to cover exchange risks.¹⁶

The exchange rate risk theory cannot account for the phenomenon of simultaneous cross investment between two currency areas. Proponents of the exchange rate theory argue that cross investment between two currency areas must occur at different times, but, at least in the case of direct investment flows between the United States and several European nations, this can easily be shown not to be true. Exchange rate risk also does not account for the fact that foreign direct investment is disproportionately concentrated in a relatively few industries (see Table 1). Neither the interest rate differential nor the exchange rate risk premium is industry dependent, and hence a priori there is no reason to expect a greater propensity for firms in some one industry to make direct foreign investment than for firms in some other industry.

Another hypothesis of direct foreign investment centering on capital market imperfections centers about portfolio theory.¹⁷ The hypothesis is that national firms become multinational in order to extend to their investors the option of holding foreign "securities" in their investment portfolios, an option which the investors do not have without the services of an intermediary such as a multinational firm. By holding foreign "securities" the investor can hypothetically construct a portfolio which has more optimal risk/return characteristics than one which contains securities of one nation only.

One test of the "portfolio" hypothesis suggests that one major securities market (the New York Stock Exchange) "behaves as if it recognizes the international composition of the activities of U.S.-based corporations."¹⁸

Several questions can be raised about the "portfolio" hypothesis. First, if the primary motivation for U.S. firms to become multinational is to diversify away non-systemic risk, why do they not simply buy securities of established non-U.S. corporations rather than making direct investments? Also, why do not these U.S. firms, in making investments overseas, diversify their holdings by industry?

Most of these hypotheses of direct foreign investment have been advanced primarily to explain the foreign investment of U.S. manufacturing firms, and especially the investment of these firms in Western Europe. The simultaneous presence of European direct investment in the United States is not well explained by any of these hypotheses - in fact, they would (except perhaps the portfolio hypothesis) disallow simultaneous cross investment between the United States and some other currency area. The fact is that European direct foreign investment in the United States does occur, and both its absolute magnitude and its size relative to U.S. direct investment in Europe have been increasing exponentially since at least the middle 1960's, while at the same time U.S. direct investment has continued to flow to Western Europe.

The relative few efforts to explain European direct investment in the United States have tended to focus on the attractiveness of the internal U.S. market to European based firms. Sheer size of the U.S. market has been mentioned as one attraction as has been the opportunities for learning by operating in the United States.¹⁹ The innovative stimuli of the U.S. market is another attraction.²⁰ A constraint placed on would-be European investors has been the ability to obtain financing on the scale necessary to set up U.S. operations, and hence the opening up of sources of finance has been viewed as a key to investment in the U.S. One aspect of this has been the emergence of European corporations of size sufficient to manage and finance subsidiaries large enough to compete in the U.S. market.²¹ One major study concludes in effect that no one hypothesis or set of hypotheses can account for a significant portion of European direct foreign investment in the United States.²²

At least two studies suggest oligopolistic behavior as a possible causal factor behind European firms establishing manufacturing operations in the United States.²³ These studies suggest that European firms become multinational themselves in order to compete effectively with U.S. multinationals. As a part of a strategy of becoming multinational, these European firms enter (and directly compete in) the U.S. market.

"Exchange-of-threat" is one possible rationale for a European firm to do so. The next section explores this rationale.

"Exchange-of-Threat" Between Oligopolists of Differing Nationality

If an oligopolist of one nationality enters a foreign market, he creates certain asymmetries both in this home market and in the foreign market in which he is an entrant. The firm which has "gone foreign" is exposed to risks and opportunities to which rival oligopolists in the "home" market are not exposed. These rival oligopolists might perceive

the opportunities of operating in the foreign market to be sufficiently great so as to enable the firm which has "gone foreign" to be able to develop some sort of advantage over them that might lead to disruption of the equilibrium of the home market oligopoly. If so, the rivals might choose to imitate the firm which has "gone foreign" by entering the foreign market themselves.²⁴

The oligopolist who "goes foreign" creates an asymmetry in the foreign market. In order to be able to think out the consequences of this let us imagine a world in which there exists but two nations, N_1 and N_2 . Suppose that in each nation there exist a monopoly producer of a product X, Firm 1 in N_1 and Firm 2 in N_2 . No international trade in X goes on, so that Firm 1 supplies the entire market for X in N_1 and Firm 2 the entire market for X in N_2 . X is the only product manufactured by Firm 1 and Firm 2.

Suppose now that Firm 1 perceives an opportunity to capture a share of the market for X in N_2 and to do so makes a direct investment in N_2 to establish a subsidiary to manufacture X. In order to take customers away from Firm 2, Firm 1 must be able to offer to customers in N_2 something that Firm 2 does not offer: a better or more specialized product, better delivery and service, a lower price, etc. Should Firm 1 choose to compete on the basis of price, it has a very special advantage (at the outset) over Firm 2.

The advantage of Firm 1 lies in the asymmetry of its market position in N_2 relative to that of Firm 2. Firm 1 holds a monopoly position in N_1 and a share of the market in N_2 , while Firm 2 holds market share only in N_2 . Because N_1 and N_2 are independent markets between which there is no trade, the price for X in one market is independent of the price in the other

market. In order to gain market share in N_2 , Firm 1 may choose to undercut Firm 2's prices. In doing so, Firm 1 reduces its margins on sales of X in N_2 but margins on sales of X in N_1 are unaffected. Should Firm 2 choose to meet Firm 1's prices, by contrast, Firm 2 suffers a reduction in margins on all sales of X.

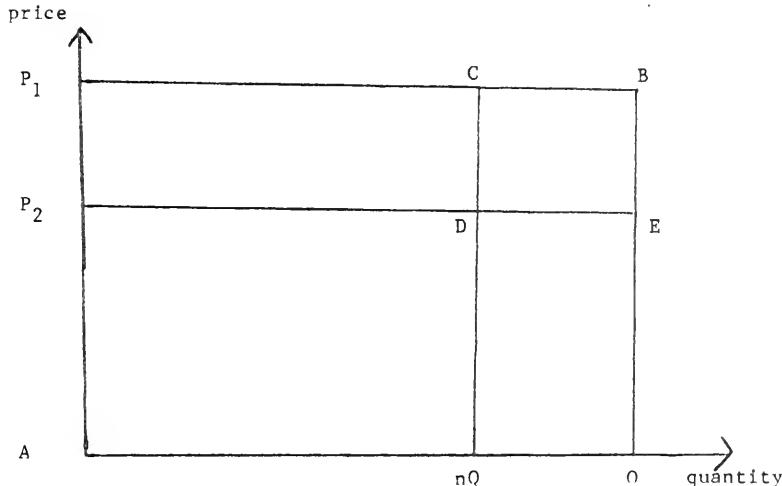
Firm 1's pricing advantage in N_2 may be compounded by a cost advantage. Firm 1's sales of X in N_1 cover all costs including overhead costs such as costs of the central office and of research and development. The subsidiary of Firm 1 in N_2 , therefore, does not necessarily have to bear the costs of these overhead items, even though the subsidiary may benefit from the services of the central offices or the research and development labs. In N_2 , Firm 1 is therefore essentially a "marginal cost" producer.²⁵ Firm 2 is, of course, a "full cost" producer.

Firm 2 could react to Firm 1's entry into the market for X in N_2 by attempting to price Firm 1 out of the market. If Firm 2 did so, it would be forced cut price on all of product X sold. To meet Firm 2's price, Firm 1 would have to cut price on only the quantity of X that was sold in N_2 . Thus, while Firm 1 would incur a loss on only a fraction of its total sales of X, Firm 2 would incur a loss on all its sales of X.

Thus, the total cost to Firm 2 of trying to price Firm 1 out N_2 would be much greater than the cost to Firm 1 of "weathering out" the price warfare. (See Diagram 1.)

Meeting Firm 1's competition head-on in N_2 is not Firm 2's only strategic option, however. Firm 2 could attempt to capture some share of the market for X in N_1 - Firm 1's home market. Were Firm 2 successfully to do so, it could bring to N_1 the same advantage Firm 1 brings to N_2 :

Diagram 1: Pricing Advantage of a Multinational Firm
Over a Firm Operating in But One Market



Assume that Firm 1 operates in nations N_1 and N_2 , and that $n\%$ of its sales result from N_1 and $(1-n)\%$ from N_2 . Firm 2 operates in N_2 only. No international trade occurs between N_1 and N_2 . Total unit sales of both N_1 and N_2 is 0. At price level P_1 in both N_1 and N_2 the total revenue of both Firm 1 and Firm 2 is $AP_1 BQ$. If Firm 2 attempts to price Firm 1 out of N_2 by lowering price to P_2 , then Firm 2's revenue is equal to $AP_2 EQ$, while Firm 1's revenue is equal to $AP_1 C + nQDEQ$. Clearly, Firm 2 damages itself more than it damages Firm 1.

Firm 2 would now be the "marginal cost" producer of X in N₁. Firm 2 could demonstrate that aggressive tactics on the part of Firm 1 in N₂ would lead to reprisal in N₁, and Firm 1 might be induced to behave less aggressively in N₂.

There are two ways that Firm 2 could supply its share of the market of X in N₁: Exportation of X to N₁ to N₂, and establishment of a subsidiary to manufacture X in N₁. Were Firm 2 to export to N₁ and were Firm 1 to possess any significant political power in its home market, Firm 1 might be able to persuade the government of N₁ to impose restrictive tariffs or quotas on the importation of X into N₁. If Firm 1 possessed a patent on X in N₁, it could stop the importation of X into N₁. Because Firm 1 manufactures X for N₂ inside N₂, Firm 2 would be able to take no similar retributive action against Firm 1. Were Firm 2 to establish a manufacturing subsidiary in N₁, the subsidiary would be immune from quick retribution such as imposition of restrictions on imports.

If both Firms 1 and 2 were to pose a threat to each other in the other's home market, such that Firm 2 could counter Firm 1's aggressive competition in N₂ with reprisal in N₁ and Firm 1 could counter Firm 2's moves in N₁ with reprisal in N₂, each firm might come to the realization that it had the other "by the tail." Each firm might then realize that continued aggressive price competition would be mutually destructive and hence both would refrain from such competition.

Because the prime motive for Firm 2 to establish itself in N₁ is to be able to threaten the stability of the market for X in N₁ in order to improve its bargaining position relative to Firm 1 in N₂, I have dubbed Firm 2's action as "exchange-of-threat." Generally, "exchange-of-threat"

might be defined as a foreign investment by a firm made in response to the entry into its "home" market by a rival firm whose "home" market is the foreign country. The foreign investment is made in order to reduce the risk to the firm that its earnings stream in its home market will be reduced by the rival firm. "Exchange-of-threat" necessarily implies a cross investment between two geographically separated markets: a firm based in one of the markets invests in the second market, and in response, a firm based in the second market invests in the first.

A cross investment based on "exchange-of-threat" would necessarily occur only in oligopolistic (or monopolistic) industries wherein sellers are able to extract a rent, as it is the rent which is "threatened" by the exchange. A priori, one would expect "exchange-of-threat" to be effective if the elasticity of demand for the individual firm is high. This would tend to be the case for non-differentiated products such as bulk chemicals, primary metals, and highly standardized manufactured goods, for which an individual firm might be able to increase its market share by means of price cutting.

Although "exchange-of-threat" logically makes sense under certain circumstances, the question remains whether or not it actually can account for any of the observed cross investment between the United States and Europe. The general question is taken up in the following section of this paper, while the remainder of this section is devoted to three specific examples of cross investments behind which the public record would indicate that "exchange-of-threat" was a major motivating factor. The examples, which occurred at different points in time in different industries, serve to illustrate that "exchange-of-threat" is a valid explanation of at least some specific cases of transnational cross investment.

The first example is that of the entrance of the Royal Dutch/Shell Company into the United States in 1913.²⁶ The Royal Dutch/Shell Company, in 1975 the largest industrial enterprise in the world outside the United States, was formed in the first decade of the 20th century when various European oil interests merged their assets as a defensive move against the competition of the Standard Oil Company. Standard Oil at the time was virtually a monopolist in the production, transportation, refining, and distribution of petroleum products in the United States. Beginning late in the 19th century, Standard sought to expand its markets internationally. At that time, the majority of the world's petroleum was produced in the United States, and at least one motive for Standard Oil's international expansion was to secure foreign markets for excess U.S. production. Royal Dutch/Shell began as a defensive alliance formed in 1902 against Standard, the major members of the alliance being The Royal Dutch Company of the Netherlands, the Shell Transport and Trading Company of Great Britain, and the Rothschild group of France. By 1907, Royal Dutch and Shell formally merged, and in 1909, many of the Rothschild's petroleum interests were bought out by Royal Dutch/Shell. In 1910, the Royal Dutch Dutch/Shell Company produced, transported, refined, and distributed petroleum products in both the Far East and in Europe. Its principal sources of crude oil were Russia, Romania, and Indonesia, while major markets included Western Europe, Central Europe, Japan, and China. In size, Royal Dutch/Shell was worldwide the second largest petroleum company, while Standard Oil was the largest.

The exact situation which provoked Royal Dutch/Shell's entrance into the United States was an effort by Standard Oil in 1910-1911 to increase market

share in Europe and the Far East by means of price cutting. According to the 1911 Annual Report of Royal Dutch/Shell:

"Although the price of crude oil was on the increase, our great competitor reduced the price of refined products on the market. This has been still more marked in the course of 1911, and has strengthened us in our conviction that the price reduction has no objective other than to hamper us as much as possible in the development of our business. A curious fact, which in our opinion is characteristic of the intentions of our competitors, is that the prices of kerosene was reduced most and quickest in the Netherlands Indies, whilst in Holland, where we sell no kerosene but only benzene, the benzene prices were reduced the most."

To the chairman of Royal Dutch/Shell, H.W.A. Deterding, the answer to Standard Oil was to counterattack the U.S. market:

"When our business grew to such international dimensions, we obviously had to dig ourselves as traders on the American soil; otherwise, we would have lost our foothold everywhere else. Until we started trading in America, our American competitors controlled world prices, because...they could always charge up their losses in underselling us in other countries against business at home where they had a monopoly."²⁷

In 1913, the Shell Oil Company of California and the Roxana Oil Company were established by Royal Dutch/Shell. These were later consolidated into the Shell Oil Company, which, was to grow into one of the world's largest industrial enterprises in its own right.

In the decades following the entrance of Royal Dutch/Shell into the United States, Standard Oil and its major successors following its dissolution and Royal Dutch/Shell gradually ceased all-out competition and increasingly perceived their interest to be in tandem.²⁸ The last major international price and market share war between these firms occurred in 1927-1928. The war, which principally involved Royal Dutch/Shell, the Standard Oil Company of New York (now Mobil Oil Corp), the Standard Oil Company of New Jersey (now Exxon, Inc.), and a relatively new entrant into

the international oil industry, Anglo-Persian, Ltd. (now British Petroleum, Ltd.), broke out in India but rapidly spread to other areas of the world. The confrontation was financially damaging to all of the major oil concerns, and in 1928 Deterding arranged for a meeting at Achnacarry Castle in England to resolve the difficulties. Out of that meeting came the "As Is" agreement which was, in effect, a cartel agreement dividing world markets among the world's largest petroleum companies.²⁹ That agreement plus the "Red Line" Agreement of 1928, allowing Exxon and Mobil to become shareholders jointly with Royal Dutch/Shell, British Petroleum, and the French CFP in the Turkish Petroleum Company (and hence giving them access to Middle Eastern oil) ushered in a new era of cooperation among the major oil companies which was to last for at least several decades.³⁰

During the 1927-28 price war, Deterding used the American Shell Oil Company to bring price warfare into the United States and in particular to capture market share from the Standard Oil Company of New York in the New England area. As such, the Shell subsidiary served the function that Deterding originally intended - as a means to carry on price competition within markets in the United States. Following the Achnacarry meeting, however, this function never again proved to be needed, at least on a large scale. The American Shell Oil Company, by this time had grown to constitute a major portion of Royal Dutch/Shell's worldwide operations. Over the following decades, the American subsidiary was to prove to be a valuable source of cash flow for the parent, especially during the financially hard years following World War II..

A second example of "exchange-of-threat" seems to have occurred in the soap and edible fats industry during the 1930's.³¹ The situation involved market share wars in the United States for detergents and vegetable

shortenings between Lever Brothers (U.S.A.), the U.S. subsidiary of British-Dutch firm Unilever, and Proctor and Gamble (P&G) of the U.S.A. In 1930, Lever Brothers was the third largest producer of soaps and related products in the United States, well behind P&G, the industry leader, and second place Colgate - Palmolive - Peet. In fact, until the late 1920's, Lever in the United States was little more than a regional New England producer. Beginning in 1926, however, under the leadership of Francis Countway, Lever began aggressively to enlarge its share of the U.S. soap and detergent markets by expanding geographically and by introducing to the market a series of heavily promoted new products.

Lever's efforts in the soap and detergent markets damaged Colgate-Palmolive - Peet more than P&G, and in 1928 Colgate - Palmolive - Peet attempted a countermove by establishing facilities to manufacture "Palmolive" soap in the U.K. In the U.K., where Unilever held a nearly monopolistic position in soap and edible fats, "Palmolive" never was able to gain a significant market share, and the effort at "exchange-of-threat" failed.

Perhaps emboldened by his success in the soap and detergent market but perhaps also as a countermove to P&G's introduction to the market of new detergents to compete with those of Lever, in 1930 Countway took steps to break P&G's highly profitable hold on the U.S. vegetable shortening market. Despite advice from the London office to the contrary, Countway introduced a shortening ("Spry") to compete with the P&G brand ("Crisco"). In what was interpreted by Unilever executives as a countermove, in 1930 P&G acquired a small British soap company, G. Hedley, Ltd.³² Over the next years, P&G was able to break the monopoly of Unilever on the British soap and detergent market: whereas in 1930, Hedley held less than a 1%

market share, in 1938 it held a 15% market share. Following World War II, P&G was able to increase its market shares both in the United States and in the United Kingdom at the expense of Unilever.

The public record suggests that "exchange-of-threat" was a factor in the motivation behind a third case, the initial entry into the United States in 1962 of the French firm Pechiney, then the World's fifth largest integrated aluminum firm.³³ It is interesting to note that although the early press reports cited "preventive pressure" on U.S. rivals who were expanding in Europe as the major reason for Pechiney's entry into the United States, press reports dealing with Pechiney's expansion of its United States operations a few years later fail to mention "exchange-of-threat" as a motivating factor.³⁴ Thus, the cases of Pechiney in the United States, Proctor and Gamble in Great Britain, and Royal Dutch/Shell in the United States seem to have at least two points in common: initial entry into the foreign market was motivated (at least in large part) by "exchange-of-threat" considerations, but later decisions to expand operations were motivated by different factors. That the initial decision to make a foreign investment can be motivated by quite different factors than later decisions to expand the resulting operations is a finding of a number of studies of the foreign investment decision process, and these three cases seem to illustrate the point nicely.³⁵

A handful of cases may illustrate that "exchange-of-threat" may have some validity for explaining specific examples of cross-investment, but the question remains as to whether or not the concept has any general validity. The next section takes this question up.

"Exchange-of-Threat:" Does It Explain Cross-Investment Between the United States and Western Europe in the Post-World War II Era?

The above question is at best a difficult one to answer. One possible approach would be to go directly to the companies involved and ask them. Two methodological problems present themselves with this approach. First, companies in general are not particularly open to efforts to gain information about the motivation behind their major international investments. Second, even if access to corporate information could be gained, it might be difficult to ascertain which of the often many stated motivations behind an investment are the primary ones. Furthermore, as was noted in the previous section, the raison d'être of a foreign subsidiary might change with time, and information gained today might not accurately reflect the thinking behind investment moves made in the past.

A second approach would be to examine the behavior of firms engaged in transatlantic investment and to attempt to infer motivation from this observation. In doing so, one always runs the risk that one's inferences are wrong. Nonetheless, this indirect approach is the one which was attempted by this researcher, mostly on the grounds that it was more practical than the direct one. In particular, the cross investment behavior of a sample of large United States-based and European-based multinational enterprises is examined. Included in the sample are 187 U.S. and 88 European firms on which extensive data were collected by researchers at the Harvard Business School between the years 1965 and

1972. The data collected include information on the more than 28,000 "foreign" subsidiaries of these (and other) firms.³⁶

To be included in the sample, the United States-based firms met three criteria:

1. Each appeared on either the 1963 or 1964 Fortune list of the "500 Largest U.S. Industrial Corporations;"

2. By the end of 1963 each firm held or had held a 25% or greater equity interest in manufacturing firms located in 6 or more nations outside of the United States; and

3. No firm was a subsidiary of some other firm.

Each Europe-based enterprise in the sample held or had held by 1970 at least one manufacturing subsidiary in the United States. In addition, each appeared on Fortune's list of the "200 Largest Industrial Corporations" for the year 1970 or had sales as great as firms which did appear on the list but for some reason was itself excluded.

The Harvard researchers believe that the 187 U.S. firms account for the bulk of U.S. direct investment in Europe and the 88 European firms the bulk of European direct investment in the United States. Exactly how much of the total of direct investment is in the hands of these firms is not known because financial data on the subsidiaries is not available, but an educated guess would be that the 187 U.S. firms hold at least 70% of all U.S. direct investment in Europe and the 88 European firms at least 80% of all European direct investment in the United States.

Table I indicates a distribution by industry grouping of the U.S. subsidiaries of the 88 European-based multinational enterprises and the

European subsidiaries of the 187 United States-based multinational enterprises. Two characteristics stand out from the table. First, the European subsidiaries per U.S. parent firm vastly outnumber the U.S. subsidiaries per European parent firm. This is due doubtlessly in part to the fact that the total value of direct investment in Europe by U.S. corporations is vastly greater than the value of European corporations' direct investment in the United States.³⁷ It may also be due to the fact that for a U.S.-based firm to create an integrated European operation it must incorporate legal subsidiaries in each of the countries in which it is to operate, while for a European-based firm to create an integrated U.S. operation it need create but one legal subsidiary in but one state of the Union.

A second characteristic is the industry by industry correlation between the European subsidiaries and the U.S. subsidiaries. An ordinary least squares regression using "European Subsidiaries of U.S. Multinationals" as one variable and "U.S. Subsidiaries of European Multinationals" as a second yields a beta (Pearson) coefficient of 0.715.³⁸ Thus, in fact, direct investment by European multinationals in the United States does tend to occur mostly in those industries in which U.S. multinationals invest heavily in Europe. The industry by industry correlation is by itself somewhat suggestive that the cross-investment might be induced by "exchange-of-threat", although alternative hypotheses can be formulated to explain the correlation.

Let us assume, however, for a moment that at least some of the cross-investment among firms in the sample is indeed induced by "exchange-of-threat". Let us further assume that in most industries it is a U.S.

Table 1: European Subsidiaries of 187 Multinational Enterprises based in the United States and U.S. Subsidiaries of 88 Multinational Enterprises based in Europe by Industry

Note: The Table includes only those subsidiaries of European corporations formed from 1950 to 1970 and subsidiaries of U.S. corporations formed from 1950 to 1967.

<u>Industry</u>	<u>SIC classification</u>	<u>European Subsidiaries of U.S. Multinationals</u>	<u>U.S. Subsidiaries of European Multinationals</u>
Food Products	20	398	26
Tobacco Products	21	12	0
Textiles and Apparel	22,23	74	7
Lumber, Wood Products Furniture	24,25	21	3
Paper and Paper Products	26	160	7
Printing and Publishing	27	14	18
Chemicals and Plastics	281,282,285-289	443	73
Drugs and Pharmareuticals	283	233	17
Soaps, Detergents, Cosmetics	284	97	9
Petroleum Refining	29	106	7
Tires	301	41	0
Other Rubber and Plastic	302-309	32	1
Leather Products	31	6	3
Store, Glass, Clay Products	32	94	6
Primary Iron and Steel	331,332	11	2
Primary Non-Ferrous Metals	333-339	80	13
Metal Cans	341	32	1
Other Fabricated Metals	342-349	127	25
Machinery, Except Electrical	35	229	24
Electrical Goods (except Electronics)	361-364,359	152	20
Electronics Goods	365-367	63	39
Automobiles	371	137	1
Aircraft	372	3	4
Other Transportation Goods	373-379	8	1
Instruments	38	38	24

Source: Extracted from data gathered by Harvard University Multinational Enterprise Project

firm (or firms) that initiates the exchange by making a direct investment somewhere in Europe and this causes some European firm (or firms) to react by making a direct investment in the United States. This second assumption is empirically justifiable. In most industries, flows of U.S. direct investment into Europe have preceded any significant Europeans direct investment into the United States.

Under these assumptions, it is clear that European direct investment in the United States must lag U.S. direct investment in Europe. For the i^{th} European firm, investment in the United States in the j^{th} industry in the year t would be triggered by direct investment by U.S. firms in that industry in the European firm's home market in years prior to t . Thus, for industry j ,

$$I_{i,t} = \sum B_{k,m} I_{k,t-m} + U_{i,t} \quad (1)$$

where

$I_{i,t}$ is a direct investment in year t in the United States by European firm i

$I_{k,t-m}$ is a direct investment in year $t-m$ in the European home market of firm i by U.S. firm k

$B_{k,m}$ is a coefficient which is either positive in value or zero reflecting the prior probability that firm i will react to firm k after a lag of m years

$U_{i,t}$ is an error term

If we assume that $B_{k,m}$ is independent of the value of k , which would be true if the European firm reacts identically to direct investment on its soil by any U.S. firm or combination of firms, then $B_{k,m} = B_m$ for all k and equation (1) can be rewritten as

$$I_{i,t} = \sum_m B_m \sum_k I_{k,t-m} = U_{i,t} \quad (2)$$

which is a distributed lag equation.

This would suggest that if "exchange-of-threat" is a valid explanation of cross investment, some distributed lag between U.S. direct investment in Europe in a particular industry and European direct investment in the United States would exist. The existence (or nonexistence) of such a distributed lag would be a test of the "exchange-of-threat" hypothesis. Although the existence of the lagged relationship would not necessarily confirm the hypothesis, nonexistence probably would lead one to reject it.

A priori it is difficult or impossible to specify by means of theoretical reasoning the exact form of the relationship implied by equation (2). The relationship is complicated by the fact that the B_m might, for certain m , be zero. In particular, if there is a lead time between the decision of firm i to respond to firms k and the actual making of an investment, B_m might be zero for $m < n$, where n is the lead time in years; furthermore in attempting to decide whether or not to react to firm k , firm i might adopt a "wait and see" attitude before making its move. Thus, the lead time might be highly unpredictable. Also, the lead time is likely to be industry dependent.

Likewise, working from the available empirical data, it is difficult to specify a model which "fits" the data.³⁹ The author (who is not an econometrician either by training or by inclination) did attempt a few simple models, the simplest of which was to examine the relationship.

$$Y_{i,t} = B_{i,t-m} X_{i,t-m} + U_{i,t-m} \quad (3)$$

where $Y_{i,t}$ is the number of manufacturing subsidiaries of the 88 European multinationals established (or acquired) in the United States in industry i in year t

$X_{i,t-m}$ is the number of manufacturing
subsidiaries of the 187 U.S.
multinationals established in
Europe in industry i in year
 $t-m$

Table 2 indicates the beta coefficients calculated from equation (3) for years $t = 1950$ to 1970, lag times $m = 0$ years to 11 years and industries i classified by two digit SIC code. Statistically significant beta coefficients are found over a range of lag times for several industry groupings, notably food products, chemical products, petroleum refining, primary metals, fabricated metals, nonelectrical machinery, electrical machinery, transportation, and instruments.

It can be shown that there exists a statistically significant positive relationship between the maximum value of the beta coefficient (from Table 2) for each industry grouping and measures of seller concentration and product differentiation for each industry.⁴⁰ The former relationship is consistent with the "exchange-of-threat" hypothesis but the latter is not. This result is not surprising. It can be shown that there is a positive correlation between those industries in which there is a propensity for direct foreign investment by United States firms to occur and those which are marked by a high ratio of research and development to value added.⁴¹ These latter industries in turn are characterized by a high rate of new product introduction, and hence by a high degree of product differentiation.

In at least two such industries, the chemical and integrated aluminum industries, there exists a wide range of products which are sold in bulk quantities and others of which are highly specialized and sold in limited quantities. My observation has been that most of European direct investment in these industries has been in plants to manufacture in bulk quantities, but I do not know if this observation can be extended to other industries.

Table 2: Beta Coefficients $B_{i,t-m}$ from Lag Equation $Y_{i,t} = B_{i,t-m} X_{i,t-m} + V_{i,t-m}$; $Y_{i,t}$ is the Number of Manufacturing Subsidiaries of 88 European Corporations Established or Acquired in the United States in Year t in Industry i , $X_{i,t-m}$ is the number of Manufacturing Subsidiaries of 187 U.S. Corporations Established or Acquired in Europe in Year $t-m$ in Industry i .

	<u>Industry</u>	<u>2 Digit SIC</u>	<u>Industry</u>	<u>Lag Time M</u>
		0	1	2
20	foodstuffs and food products	.09*	.14*	.61
21	tobacco	-	-	-
22	textiles	.15*	.19*	.34*
23	apparel	-	-	-
24	wood and lumber	-.15*	-.15*	.11*
25	wooden products, furniture	-.10*	-.10*	-.10*
26	paper and paper products	-.10*	-.05*	-.24*
27	printing and publishing	-.33*	-.06*	.02*
28	chemicals, drugs, plastics	-.30*	-.09*	.19*
29	petroleum refining	.05*	-.15*	-.15*
30	rubber and plastics products	-.02*	-.18*	-.21*
31	leather products	-	-	-
32	store, glass, clay	-.50	-.31*	-.35*
33	primary metals	-.14*	.03*	-.02*
34	fabricated metals	-.11*	-.10*	.18*
35	machinery, except electrical	.19*	.41*	.39*
36	electrical machinery	-.13*	-.12*	-.16*
37	transportation	.20*	.56	.80
38	instruments	.00	-.08*	.05*
				3
				4
				5
				6
				7
				8
				9
				10
				11

* coefficients marked by an asterisk not statistically significant from 0 in a one tailed t-test,
0.99 confidence interval t coefficients not marked bt asterisk statistically significant.

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These statistical results do suggest that in some industry groupings European direct investment in the United States has lagged U.S. direct investment in Europe in some systematic fashion. Importantly, the parameters of the lagged relationship vary from industry to industry, indicating that the lag is unlikely to be a function of some general economic variable (such as interest rate differential, exchange rate risk, or the like). From the data I cannot demonstrate exactly what the lagged relationship is, and given the apparent differences in the relationship industry to industry, to attempt to specify the relationship might be quite a fruitless undertaking.

An objection to the "exchange-of-threat" hypothesis is contained in the information presented in Table 2. This is that the indicated lag times between the U.S. investment in Europe and the hypothetical response of the Europeans is too great (for most industries) to be the lead times between perception of a threat and a response to it. The long lag times could be accounted for by the time needed for European firms to overcome barriers to entry to the United States market. If so, the question arises as to whether the lags indicated in Table 2 are accounted for by barriers to entry only, or are the lags accounted for by both barriers to entry and by "exchange-of-threat"? From the data, one cannot tell.

Another valid objection to the results presented herein might be that the industry groupings used to construct Table 2 are quite aggregated. Because of the rather small total of subsidiaries of the 88 European multinational enterprises, it is difficult to work with data disaggregated much beyond the two digit SIC level of industrial classification.

The statistical results are generally consistent with the hypothesis that at least some direct investment in the United States occurs as a result of "exchange-of-threat", although the results fall well short of being totally convincing. Based on my own probings into the statistics (buttressed somewhat by a limited number of off-the-record interviews with executives of European firms which have made direct investments in the United States), I am personally convinced that defensive considerations such as "exchange-of-threat" do bear upon at least some recent decisions by European firms to invest directly in the United States. I would conclude that this factor is often overlooked in efforts to explain the observable increase in European direct investment in this country, and that at the least further investigation would be indicated.

References

¹"Imperfections" here implies deviations from the assumptions of the neoclassical model of "perfect" competition.

²C.P. Kindleberger, American Business Abroad (Yale University Press, 1969) Lecture 1. Kindleberger's argument is that in a world of "perfect competition", any firm attempting to operate outside of its national "home" market is at an immediate disadvantage relative to local competitors. The subsidiary of a foreign-based firm, at the outset at least, is not as attuned to local conditions as is a local firm, and the subsidiary therefore must pay a premium for information. The subsidiary may also be subjected to discriminatory regulation by local governments. If the subsidiary does not possess some sort of advantage over a local firm to offset these disadvantages - and in a "perfectly" competitive world no such advantage can exist - the costs of the disadvantages are such as to raise the average costs of the foreign firm relative to those of the local firm. Thus, in equilibrium, the average cost per unit of production to the foreign firm will exceed revenue per unit, and the foreign firm will accumulate net losses.

³S.A. Hymer, The International Operations of National Firms: A Study of Direct Foreign Investment (Unpublished Ph.D. Thesis, M.I.T., 1960).

⁴Behavior of firms in oligopolies is discussed in most texts in industrial organization, including R.E. Caves, American Industry: Structure, Conduct, Performance, 2nd Edition (Prentice-Hall, 1967); J.S. Bain, Industrial Organization, 2nd Edition (Wiley, 1968), F.M. Scherer, Industrial Market Structure and Economic Performance, (Rand McNally, 1970); see also Michael Nicholson, Oligopoly and Conflict (University of Toronto, 1972).

⁵In the limiting case, the advantage may be possessed by only one firm in which case the industry is initially a monopoly. If, as is described in the text, barriers to entry erode over time, the industry will evolve into an oligopoly. The initial advantage may be based on possession of vital knowledge resulting in a highly differentiated product, a scale advantage, an absolute cost advantage, possession of a preferred trade name, or some combination of these. For a discussion of barriers to entry, see J.S. Bain, Barriers to New Competition (Harvard University Press, 1966).

⁶These conditions are discussed by Hymer (op. cit.) and developed more fully by Raymond Vernon in "The Location of Economic Activity" in J.H. Dunning, ed. Economic Analysis and Multinational Enterprise (London; Allen and Urwin, 1974).

⁷A critical assumption is that members of the oligopoly can jointly act to set and maintain the stayout price. This could come about either if the oligopolists colluded, overtly or tacitly, or simply if they were able to recognize a common interest.

⁸The product life cycle as an explanation of foreign direct investment first appeared in Raymond Vernon's article "International Investment and International Trade in the Product Cycle," Quarterly Journal of Economics, 80 (May, 1966). The idea is further developed in Raymond Vernon, Sovereignty at Bay(Basic Books, 1971) and in Louis T. Wells, The Product Life Cycle and International Trade (Harvard University Graduate School of Business Administration, 1973); it should be noted that the product life cycle incorporates many of the ideas of Hymer's 1960 study.

⁹In many industries major U.S. firms have historically been well advanced over their non-U.S. counterparts in industrial innovation. This does not imply that large U.S. firms, or even the United States itself, have been the major sources of technological innovation. Rather, U.S. firms have been at the forefront of applying technological innovation - often borrowed from somewhere else - to the development of commercialable products and processes. For a discussion of the distinction between industrial innovation and technological innovation, see Edwin Marsfield, The Economics of Technological Change (Norton, 1968), especially pages 84-86.

¹⁰Especially in the woodworking and metalworking industries, U.S. firms were advanced over European firms in the development of capital intensive production processes by the second half of the 19th century. See Mira Wilkins, "Multinational Enterprises: A Consideration of the Investment Strategies of Western Multinational Enterprises in the 19th and 20th century, with emphasis on the U.S. Corporation Abroad" (unpublished). Technological knowledge as a factor behind direct investment are stressed by H.G. Johnson in his Comparative Cost and Commerical Policy Theory for a Developing World Economy (Almqvist and Wiksell, 1968) and "The Efficiency and Welfare Implications of the International Corporation", in Kindleberger (op. cit.) as well as by W. Gruber, P. Mehta, and R. Vernon in "The R and D Factor in International Trade and International Investment of United States Industries", Journal of Political Economy, Volume LXXV, No. 1 (February 1967). A variant on the argument is offered by R.E. Caves in "International Corporations: The Industrial Economics of Foreign Investment", Economica (February, 1971), who suggests that product differentiation is the key element of advantage. Product differentiation can be, of course, a fruit of advanced technological knowledge.

¹¹See Robert Stobaugh, The Product Life Cycle, U.S. Exports, and International Investment (unpublished D.B.A. Thesis, Harvard Business School, 1968); R. Polli and V. Cook "Validity of the Product Life Cycle", Journal of Business, Vol. 42, No. 2 (Oct. 1969). Louis T. Wells, Jr., "Test of a Product Life Cycle Model of International Trade", Quarterly Journal of Economics, Vol. 83, (Feb. 1969).

¹²See Thomas Horst, At Home Abroad: A Study of the Domestic and Foreign Operations of the American Food Processing Industry (Ballinger, 1974).

¹³See R. Z. Aliber, "A Theory of Direct Foreign Investment", in C. P. Kindleberger (op. cit.).

¹⁴ The argument holds only if, ceteris paribus, the interest rate differential accurately reflects the exchange risk plus the preferred currency premium. In The Economics of Corporate Exchange Risk (unpublished, 1974), Aliber argues that in the long run actual exchange risk plus premiums between major currencies have in fact been reflected by interest rate differentials, when the interest rate differentials are adjusted for differences in rates of inflation in the economies of the respective currency areas. The empirical data presented, however, is not particularly supportive unless one is willing to accept certain rather heroic assumptions. (One necessary such assumption, for example, is that the investor viewed Western Germany in the 1960's as a much riskier area for investment than neighboring France!)

In a recent paper Rudiger Dornbusch argues that asset markets, in the short run at least, determine exchange rates under a flexible exchange rate regime and thus "that expectations and changes in expectations as much as changes in money supplies dominate the course of the exchange rate in the short run." Can these expectations lead to an exchange rate risk premium being reflected in the interest rate differential between two currency areas? It is difficult to say at the least. Dornbusch and others who have written on the theory of exchange rate determination do, however, tend to see speculator expectation and money supply factors as causing exchange rate movement (in a flexible exchange rate scheme) rather than the other way around, as Aliber implicitly assumes. Aliber's exchange rate risk premium makes more sense under a Bretton Woods-type regime of fixed exchange rates than under flexible exchange rates; in the fixed rate regime, the premium could be generated by investor anticipation of sudden changes in exchange rates. (See Rudiger Dornbusch, "The Theory of Flexible Exchange Rate Regime and Macroeconomic Policy" (M.I.T. Department of Economics Working Paper No. 165, September 1975)).

¹⁵ This is true only if the securities market in the strong currency area exacts no exchange risk premium for local investors' incomes deriving from weak currency areas. No test of this rather critical assumption is offered.

¹⁶ See C.M. Aho, "The Effects of Disequilibrium Exchange Rates on Foreign Investment Decisions" (unpublished, 1974); in fact, during the late 1960's, when the dollar was overvalued relative to major European currencies, interest rates were lower in the United States than Europe. Thus, the interest rate differential not only failed to "cover" the exchange risks, but it in effect put a premium on the U.S. currency.

¹⁷ See H. Levy and M. Sarrat, "International Diversification in Investment Portfolios, American Economic Review (Sept. 1970); Donald R. Lessard, "World, National, and Industry Factors in Equity Returns," (unpublished, 1973).

¹⁸ See T. Agmon and D.L. Lessard, "International Diversification and the Multinational Corporation: An Investigation of Price Behavior of the Shares of U.S.-Based Multinational Corporations on the NYSE," (unpublished 1975).

¹⁹ Christopher Tugendhat, The Multinationals (Random House, 1971); I.C. Franko, European Business Strategies in the United States (Business International, 1971).

²⁰ Franko (op. cit.).

²¹ A.W. Sametz, "The Foreign Multinational Company in the U.S." (unpublished, 1973); S. Hymer and R. Rowthorne, "Multinational Corporations and International Oligopoly," in C.P. Kindleberger, The International Corporation (op. cit.).

²² D.S. McClain, Foreign Investment in United States Manufacturing and the Theory of Direct Investment (unpublished Ph.D. thesis, M.I.T., 1974)

²³ Hymer and Rowthorne (op. cit.); Sametz (op. cit.);

²⁴ There is evidence to indicate that oligopolistic imitation can account for much of the foreign investment of U.S.-based firms. See F.T. Knickerbocker, Oligopolistic Reaction and Multinational Enterprise (Harvard Business School, 1974).

²⁵ Even though Firm 1 is manufacturing in N2 and not exporting to N2 from N1, Firm 1 can in effect "dump" X in N2 at less than full cost. See Jacob Viner, Studies in the Theory of International Trade (Harper and Brothers, 1937) Section VIII for an exposition on "dumping" in international trade.

²⁶ Source material for this illustration includes K. Beaton, Enterprise in Oil (Appleton-Century-Crofts; 1957); F. Gerrotson, A History of the Royal Dutch (E.S. Brill, 1953); R. Hidy and M. Hidy, Pioneering in Big Business: A History of Standard Oil (Harper and Bros., 1955). For a more detailed description of Royal Dutch/Shell's entrance into the United States, see my own Oligopolistic Imitation and European Direct Investment in the United States (unpublished D.B.A. thesis, Harvard University, 1974).

²⁷ H.W.A. Deterding, quoted in Beaton (op. cit.) pg. 58.

²⁸ Standard Oil was legally split into 33 separate operating companies in a 1911 anti-trust decree. According to one study, however, the major successor firms continued to behave one for at least a decade following the 1911 decree. (See J.D. Nevins, Study in Power, John D. Rockefeller (Scribner and Sons, 1953) Vol. II.) The memoirs of H.W.A. Deterding reveal that he continued to look upon Standard Oil as but one organization throughout his long tenure as chief executive of Royal Dutch/Shell.

²⁹ The price war, the "As Is" agreement and subsequent cartel agreements are described in The International Petroleum Cartel (United States Federal Trade Commission, 1952) Part III.

³⁰ See the FTC report (above); see also edith T. Penrose, The Large International Firm in Developing Countries: The International Petroleum Industry (George Allen and Unwin, 1968).

³¹ See Charles Wilson, The History of Unilever (Praeger, 1968), Vol. II.

³² See Wilson (op. cit.) pg. 355.

³³ See "The Game Two Could Play", Forbes (Dec. 1, 1964, pg. 40).

³⁴ See for example "Pechiney Multinational," Entreprise (Sept. 14, 1968).

³⁵ The point is strongly made by Yair Aharoni, The Foreign Investment Decision Process (Division of Research, Harvard Business School, 1967); several of the authors already cited made the same point.

³⁶ A list of the 275 firms is contained in the Appendix to Chapter 3 of my Oligopolistic Imitation and European Direct Investment in the United States, op. cit. A thorough analysis of the position of the 187 U.S. firms' position in the world economy can be found in Vernon, Sovereignty at Bay, Chapter 3. See also James Vaupel and Joan Curhan, The World's Multinationals Enterprises (Div. of Research, Harvard Business School 1973), for additional information on these firms and the data that were collected.

³⁷ For example, the U.S. Department of Commerce reported that the book value at year end 1972 of U.S. direct investment in Europe to be \$30.7 billion, while the book value at year end 1972 of European direct investment in the United States was reported to be \$10.4 billion.

³⁸ The beta coefficient is statistically significant from 0 within a 0.999 confidence interval.

³⁹ The difficulties are well described by Zvi Griliches in "Distributed Lags: A Survey", Econometrica, Volume 35, No. 1 (January 1967).

⁴⁰ See my "Oligopolistic Imitation and European Direct Investment in the United States" (op. cit.) Chapter 4.

⁴¹ See F.T. Knickerbocker, Oligopolistic Reaction and Multinational Enterprise (op. cit.), Chapter 2.

